

U. S. DEPARTMENT OF AGRICULTURE, WEATHER BUREAU.

CALIFORNIA SECTION.

G. H. WILLSON, District Forecaster.

VOL. XX. SAN FRANCISCO, JANUARY, 1916. No. 1.

GENERAL SUMMARY.

The weather of January, 1916, was the most remarkable experienced in California in many years. The monthly mean temperature for the State, 39.8°, or 6.0° below the normal, was the lowest recorded during 20 years, which is the length of the State record. At numerous stations the month was more than 10° colder than the average January. The month was uniformly cold throughout, due largely to the persistent cloudy skies. The periods of severest cold were those of January 1-2, 11-12, and 29-31, at which times frosts occurred in the interior valleys. The lowest temperature experienced in the State, that of -36° which occurred at Bridgeport on the 31st, is not often equalled.

The average precipitation for the State was 15.61 inches, or 10.20 inches above the normal. With the exception of January, 1909, this was the heaviest recorded during any month since State records were begun in 1897. In San Francisco the rainfall was the heaviest received during any month in the past half-century, and has been exceeded but twice in 66 years, which is the length of the record. In the State as a whole the amount was well distributed throughout the month, and most of it accompanied the storms of January 1-3, 13-19, and 26-29. These three storms were among the most severe experienced during recent years. The first of the three was confined principally to the central and north portions of the State, where it brought a generous rainfall. In the San Francisco Bay region the accompanying wind reached destructive velocities, and caused the loss of one life, in addition to doing considerable damage to property. The second storm, while accompanied by general precipitation throughout the entire State, was especially severe in the San Joaquin Valley, and also in southern California, where torrential rains occurred. At Squirrel Inn, in San Bernardino County, the 24-hour precipitation of January 16-17 was 16.81 inches, one of the heaviest for that interval of time ever recorded in the United States, and a new record for this State. These rains, augmented by the water from melting snow in the mountains, produced freshets in the smaller streams, which in several instances gave the highest stages ever recorded. Lowlands were inundated and serious damage to roads and bridges resulted. In the Tia Juana Valley alone three deaths occurred from the flood waters, and a number of villages were partially submerged. In the mountains additional loss of life resulted from exposure. Immediately following the downpour of rain a southwest gale wrought havoc with wires in the southern portion of the State. In the Kern County oil fields the high winds did tremendous damage to oil derricks, more than 400 of which were blown down in the Bakersfield district alone.

Before the southern part of the State had fully recovered from the effects of the second storm of the month, a third severe storm arrived on January 26th. This storm, which persisted until the 29th, was one of the most disastrous ever experienced in California. Like the second storm, the rainfall, while general, was heaviest in the central and southern portions of the State. The soil, already saturated by previous unprecedented rains, was unable to absorb more moisture, and wide-spread floods followed. Ranches were partially or wholly inundated, and various stream-beds, which usually carry but small rivulets, became raging torrents of water. The dam at Lower Otay, part of the San Diego water system, gave way on the evening of January 27th, and caused the loss of 17 lives, besides doing immense property damage. Violent gales followed, and a velocity of 104 miles per hour was recorded at Point Reyes on the 27th. Regardless of the fact that storm warnings were displayed, the

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PRESSURE.

The monthly mean atmospheric pressure for the State, reduced to sea-level, was 29.99 inches. The highest was 30.66 inches at Independence on the 31st. The lowest was 28.81 inches at Point Reyes on the 27th. The range for the State was 1.85 inches.

TEMPERATURE.

The monthly mean temperature for the State was 39.8 degrees, which is 6.0 degrees below the normal. The highest monthly mean was 55.0 degrees, at King City, and the lowest was 15.4 degrees, at Bridgeport. The highest temperature, 89 degrees, occurred at Blythe on the 22nd, and the lowest, -36 degrees, at Bridgeport on the 31st. The range for the State was 111 degrees.

PRECIPITATION.

The average precipitation for the State was 15.61 inches, or 10.20 inches above the normal. The greatest monthly amount was 50.29 inches, at Squirrel Inn, and the least monthly amount was 0.60 inch, at Sterling. The greatest amount in 24 hours was 16.81 inches at Squirrel Inn on January 16-17.

RELATIVE HUMIDITY.—(Per Cent.)

Stations.	5 a. m.	5 p. m.	Mean.
Eureka.....	90	81	86
Fresno.....	85	71	78
Los Angeles.....	89	78	84
Mount Tamalpais.....	93	94	94
Red Bluff.....	89	78	84
Sacramento.....	90	76	83
San Diego.....	88	76	82
San Francisco.....	88	74	81
San Jose.....	94	74	84
San Luis Obispo.....	91	79	85

SUNSHINE AND CLOUDINESS.

Stations.	Actual hours of sunshine.	Per cent. of the possible.
Eureka.....	118	40
Fresno.....	97	31
Los Angeles.....	129	41
Mount Tamalpais.....	52	17
Red Bluff.....	79	26
Sacramento.....	116	36
San Diego.....	152	48
San Francisco.....	65	21
San Jose.....	72	23
San Luis Obispo.....	94	30

WIND MOVEMENT.—(Miles.)

Stations.	Total movement for month.	Average hourly velocity.	Maximum velocity.	Direction.	Date.
Eureka.....	6,467	8.7	43	nw.	27
Fresno.....	4,887	6.6	52	sw.	27
Independence.....	3,991	5.4	48	sw.	27
Los Angeles.....	5,831	7.8	34	sw.	27
Mount Tamalpais.....	14,748	19.8	63	sw.	2
Point Reyes.....	17,351	23.3	104	nw.	27
Red Bluff.....	5,496	7.4	26	s.	8
Sacramento.....	7,746	10.4	50	se.	2
San Diego.....	6,399	8.6	54	s.	27
San Francisco.....	6,346	8.5	48	sw.	2
San Jose.....	6,411	8.6	46	se.	3
San Luis Obispo.....	3,257	4.4	25	w.	27

The prevailing direction of the wind for the State was south.

Climatological Data for January, 1916.

Stations.	Counties.	Elevation, feet.	Length of record, years.	Temperature, in degrees Fahr.						Precipitation, in inches.				Number of days.			Prevailing direction of wind.	Observers.		
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Greatest in 24 hours.	Snowfall (un-melted).	Precipitation 31 inch or more.	Clear.			Partly cloudy.	Cloudy.
Alturas	Modoc	4,400	12	22.5		49	23	-18	20	45	4.35	+2.27	1.44	37.5	22	1	15	15	Prof. C. B. Towle.	
American Camp	Tuolumne	3,200	1	36.9		55	11	14	11	41	17.63		2.34	50.0	21	11	1	19	U. S. Forest Service.	
Angiola	Tulare	208	16	41.2	-5.2	60	5	20	72	40	4.49	+2.99	0.78	0	9			19	Santa Fe Co.	
Antioch	Contra Costa	46	37	45.6	-0.9	61	2	31	112	23	9.37	+6.88	2.65	T.	16	4	13	14	Southern Pacific Co.	
Arrowhead Springs	San Bernardino	2,000	7																John Jurgens.	
Atascadero	San Luis Obispo	837		43.5		60	17	24	12	27	15.51		3.94	0	20	12	2	17	Colony Holding Corp.	
Auberry	Fresno	2,050		39.0		55	17	20	11	27	15.19		1.79	7.5	19	4	7	20	S. J. & E. Ry. Co.	
Auburn	Placer	1,360	45	39.6	-6.0	55	3	25	11	21	13.17	+6.69	1.71	9.0	25	4	3	24	Southern Pacific Co.	
Avalon	Los Angeles	30	6																T. S. Manning.	
Azusa	do	540	14	45.5	-7.5	62	22	28	112	29	20.32	+16.41	6.10	0	19	8	3	20	sw.	
Badgad	San Bernardino	784	13	53.2	+0.2	67	18	36	12	26	0.88	+0.55	0.88	0	1	8	11	12	do	
Bakersfield	Kern	404	27	47.8	+0.4	73	27	37	27	31	2.70	+0.99	1.10	0	15	5	11	4	w.	
Barstow	San Bernardino	2,105	13	43.2	-4.6	62	16	24	1	31	3.39	+2.77	1.03	0	9	14	13	4	n.	
Berkeley	Alameda	317	29	44.8	-2.7	56	12	32	31	19	16.54	+11.16	3.52	T.	25	2	6	23	s.	
Betteravia	Santa Barbara	155	3	47.8		66	123	27	6	26	7.86		1.80	0	15	10	2	19	s.	
Biggs	Butte	98	17										5.90	2.00	5.0	12	4	0	27	s.
Bishop	Inyo	4,450	21	24.6	-14.1	29	4	-15	30	51	9.51	+8.04	2.60	59.0	12	10	0	21	.....	
Bishop Creek	do	8,500	6										2.40	91.0	11	9	0	22	.....	
Blocksburg	Humboldt	1,700	10	35.4		58	23	118	31	30	17.06		2.25	96.5	23	0	2	29	se.	
Blue Canon	Placer	4,695	17	29.8	-8.5	47	16	11	11	19	29.42	+15.79	3.00	227.8	25	5	2	24	.....	
Blythe	Riverside	268	7	51.0		89	22	12	12	59									n.	
Bonita	San Diego	110		51.3		66	23	30	12	30	10.29		2.16		14	10	9	12	e.	
Branscomb	Mendocino	2,000	16	35.6	-7.3	48	23	16	30	25	25.43	+6.27	4.23	36.0	25	3	4	24	sw.	
Brawley	Imperial	-105	6	52.0		72	6	25	112	38	1.39		0.36	0	6				.....	
Bridgeport	Mono	6,500	2	15.4		42	22	-36	31	55	6.70		1.75	120.0	16	9	6	16	sw.	
Burney	Shasta	3,300	6	27.8		45	23	-5	31	37	11.48		2.00	85.0	23	3	5	23	.....	
Cahuilla	Riverside	3,600	5	34.5		62	19	6	12	44	14.61		2.25	9.0	14	8	6	17	sw.	
Calaveras Ranger Sta.	Calaveras	3,400		34.4		48	14	10	11	41	23.84		2.34	62.0	22	3	10	18	s.	
Calexico	Imperial	0	11	52.2	-1.5	75	18	25	12	41	1.09	+0.81	0.50	0	5	24	0	7	.....	
Campbell	Santa Clara	217	19	45.4	-2.2	60	23	29	31	19	10.05	+7.35	2.30	0	20	5	8	18	se.	
Campionville (near)	Yuba	3,500	9	33.0		44	3	16	11	22	29.01		4.80	129.0	26	2	3	26	.....	
Canon Dam	Plumas	4,570	2	23.4		40	24	0	31	33	19.22		3.80	97.0	20	4	5	22	s.	
Cascada	Fresno	4,900		31.2		49	6	9	11	32	21.07		2.15	72.0	21	11	0	20	.....	
Cedarville	Modoc	4,675	22	24.4	-5.6	50	24	-4	20	33	3.72	+1.71	1.25	52.0	13	6	12	13	sw.	
Center Ranger Station	Tuolumne	3,850																	.....	
Centerville	Butte	490	2	40.8		56	11	24	11	32	22.08		5.20	10.0	23	3	4	24	s.	
China	do	189	46	43.0	-3.9	54	22	28	42	22	12.08	+7.35	3.80	8.5	21	2	10	19	s.	
China Flat	Humboldt	600	7	39.4		62	21	24	130	21	16.74		2.39	25.5	23	3	6	20	nw.	
Clermont	Los Angeles	1,200	24	46.6		63	7	28	112	31	18.37	+14.45	4.68	0	18	8	4	19	.....	
Cloverdale	Sonoma	840	14	42.8	-4.6	58	27	28	115	23	16.73	+4.90	2.53	5.8	25	4	3	24	n.	
Coalinga	Fresno	663	4	44.4		64	18	27	12	35	5.06		1.05	0	18	9	3	19	w.	
Colfax	Placer	2,421	45	34.3	-10.1	56	31	15	11	38	22.13	+12.83	4.25	57.0	21	3	0	28	sw.	
Colusa	Colusa	60	13	41.9	-4.1	56	25	28	11	17									.....	
Converse Nursery	San Bernardino	6,000	2	33.6		54	17	9	30	34	28.41		7.42	46.0	18	4	8	19	w.	
Corona	Riverside	615	2	47.4		61	116	30	11	30	17.12		5.00	0	19	8	4	19	sw.	
Crescent City	Del Norte	125	2	40.6	-6.2	55	4	29	119	21	23.18	+11.50	3.22	10.5	28	1	1	29	sw.	
Cuyamaca	San Diego	4,677	17	35.8	-1.3	55	8	15	12	27	36.50	+29.52	8.54	26.0	20	8	0	23	w.	
Davis	Yolo	51	44	43.2	-4.4	55	23	30	11	19	11.01	+7.31	3.93	7.0	18	4	12	15	se.	
Deer Creek	Nevada	3,700	9	31.3		45	21	7	31	33	33.54		6.50	189.0	23	2	2	27	se.	
Del Monte	Monterey	25	5	49.8		63	14	32	31	24	10.10		1.82	0	20	6	6	19	sw.	
Delta	Shasta	1,138	31	33.4	-9.9	50	4	18	28	24	31.51	+20.22	4.38	40.5	18	7	0	24	.....	
Denair	Stanislaus	126	16	43.6	-2.8	60	4	27	31	22	3.85	+1.68	0.76	1.5	10	8	1	22	.....	
De Saba	Butte	2,500	12	34.1		46	12	12	31	34	31.37	+13.79	7.15	105.0	24	0	4	27	se.	
Dobbins (near)	Yuba	1,650	12	41.4	-7.4	54	13	26	11	24	18.89	+6.91	4.22	21.0	27	1	2	28	.....	
Downville	Sierra	3,150	5	31.8		45	3	6	11	32	30.22		6.95	110.2	26	3	5	23	sw.	
Dudley	Kings	595	4	47.6		70	17	26	1	32	3.54		1.00	0.5	10	4	8	19	sw.	
Dudleys	Mariposa	3,000	7	32.8		48	14	-1	30	38	19.60		2.15	48.5	19	7	2	22	sw.	
Dunsmuir	Siskiyou	2,285	27																.....	
Durham	Butte	160	21	41.7	-3.6	55	24	27	31	24	12.61	+7.18	4.00	10.0	14	3	3	25	s.	
East Park	Colusa		2	38.8		59	25	19	30	27	8.12		1.31	14.5	20	3	3	25	s.	
Edison	Kern	2,500	2	45.3		68	9	31	12	23	4.93	+2.83	1.38	0	22	3	8	20	.....	
El Cajon	San Diego	482	17	50.3		70	8	28	31	26	16.69	+14.26	5.60	0	15	13	2	16	.....	
Electra	Amador	725	12	42.3	-6.1	58	3	28	32	23	13.97	+5.22	2.02	0.2	22	10	4	17	.....	
Elsinore	Riverside	1,300	16	46.0		66	16	25	12	34	14.83	+11.68	3.43	0	16	8	7	17	sw.	
Emigrant Gap	Placer	5,230	42	28.4	-6.5	47	124	13	31	27	32.62	+11.51	2.90	210.0	24	7	3	21	sw.	
Escondido	San Diego	657	22	47.7	-1.8	65	8	37	12	33	19.55	+15.69	5.53	0	17	4	15	12	sw.	
EUREKA	Humboldt	64	30	43.0	-3.9	56	27	32	30	16	13.02	+5.43	1.92	1.4	28	2	5	24	se.	
Folsom	Sacramento	252	44	45.4	-1.7	60	12	30	12	20	13.47	+8.76	2.06	2.5	19	7	0	24	s.	
Fontana	San Bernardino	1,325	4	45.6		64	22	27	13	30	17.51		4.91	0	18	9	4	18	sw.	
Fordyce Dam	Nevada	6,500	21	39.8		60	24	15	120	14	25.18	+12.97	5.18	262.0	22	3	3	25	sw.	
Fort Bidwell	Modoc	4,375	27	23.4	-6.4	44	23	-4	20	27	3.95	-0.29	1.00	53.0	18	1	7			

Climatological Data for January, 1916.-Continued.

Table with columns: Stations, Counties, Elevation, Length of record, Temperature (Mean, Departure from normal, Highest, Date, Lowest, Date, Greatest daily range), Precipitation (Total, Departure from normal, Greatest in 24 hours, Snowfall, Precipitation of inch or more), Number of days (Clear, Partly cloudy, Cloudy), Prevailing direction of wind, Observers.

Climatological Data for January, 1916.—Continued.

Stations.	Counties.	Elevation, feet.	Length of record, years.	Temperature, in degrees Fahr.							Precipitation, in inches.				Number of days.			Prevailing direction of wind.	Observers.		
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Greatest in 24 hours.	Snowfall (unmelted).	Precipitation of inch or more.	Clear.	Partly cloudy.			Cloudy.	
Ukiah	Mendocino	620	23	40.6	-4.4	59	23	25	11	20	14.26	+5.91	2.32	12.5	26	3	7	21	se.	Dr. George McCowen.	
Vacaville	Solano	175	28	42.9	-3.9	56	2	25	20	25	19.83	+13.84	3.86	7.0	25	7	1	23	sw.	J. E. Bassford.	
Valyermo	Los Angeles	3,750	28	39.3		61	8	16	11	34	6.31		2.77	9.3	9	3	2	26		U. S. Forest Service.	
Visalia	Tulare	334	28																	Santa Fe Co.	
Walnut Creek	Contra Costa	149	2	46.0	-0.7	60	2	33	31	22	15.52	+11.00	4.55	0	23					R. L. Nougaret.	
Warner Springs	San Diego	3,165	8	43.8		67	8	20	12	38	18.92		5.08	0	19	11	3	17		J. A. Ream.	
Wasco	Kern	336	16	46.4	+0.9	68	17	26	30	30	2.66		2.60	0.92	13	13	0	18	sw.	Santa Fe Co.	
Wheatville	Santa Cruz	23	20	47.4	-4.0	64	4	30	11	28	12.83		+7.90	2.60	2	11	3	22	s.	Spreckels Sugar Co.	
Weaverville	Trinity	2,162	4	32.7		48	15	10	31	33	10.11		+2.69	2.00	35.5	21	6	3	22	sw.	U. S. Forest Service.
Weitchpec	Humboldt	1,700	6	35.0		53	22	19	30	21	19.94		+12.52	3.50	68.0	29	2	10	19	sw.	G. S. Garnett.
West Branch	Butte	3,216	2	31.8		48	31	12	11	36	32.96		6.42	135.3	25	2	2	27	s.	Pacific Gas & Electric Co.	
Wheatland	Yuba	84	29	43.3	-1.5	57	3	29	11	21	10.51		+5.99	3.07	3.5	21	5	7	19	sw.	Wm. Lumbard.
Willows	Glenn	136	37	42.0	-3.2	59	25	24	11	25	7.19		+3.70	2.21	9.0	16	11	3	17	s.	F. E. Barnhouse.
Yorba Linda	Orange	405	2	49.8		63	17	31	11	32	13.68			3.52	0	17	4	9	18	w.	S. J. Walker.
Yosemite	Mariposa	3,945	12	35.0		62	8	13	11	33	16.60		+8.45	3.09	94.5	20	3	10	18	s.	J. R. Kelly.
Yreka	Siskiyou	2,625	27	26.0		50	24	-4	29	35	6.05			1.90	33.2	23	1	5	25	nw.	U. S. Forest Service.
Means and Extremes				39.8	-6.0	75	18	-36	31	60	15.61	+10.20	16.81	37.2	19	6	5	20	s		

The departures from the normal temperature and precipitation are computed only for such stations as have ten or more years of record, but all complete reports are used in determining section or division means.

\* Temperature extremes are from observed readings of the dry bulb; means are computed from observed readings.

† Also on other dates.

T. Precipitation is less than 0.01 inch rain or melted snow.

a, b, c, etc., indicate respectively, 1, 2, 3, etc., days missing from the record.

Special Rainfall Stations in Los Angeles and San Bernardino Counties for January, 1916.

Stations.	Day of Month																															Total.				
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31					
Camp Baldy																																				
Camp Bonita																																				
Camp Rincón	1.78	.24	.18	.36	.17				1.20	.81	1.00																									
Camp Iron Forks																																				
Clearwater Power House	1.50	.80	.45	.31	.43			1.43		1.80					1.12						16.75															
Dorman's Ranch		1.55	.03	.03		.02				.98	.60																									
Littlelands	.01	.20	.80	.15	.30	.10			.75	.35	.56				1.20																					
Mount Wilson	.27	1.47	.03	.57	.42	.18		1.23		1.00				.62	.31	.58	6.38	4.37	1.14																	
Nenach		.25	.20	.12					.04	.04					.25		1.40	.90	.25																	
Pacoima		.60	.40	.26	.55	.09			.96	.45	.15				.20		4.50	3.05	.57	.15																
Santa Anita Forest Station																																				
Tyunga Canon																																				

(Continued from page 3.)

steamer Aberdeen left San Francisco Bay on that day and was wrecked off the Golden Gate a few hours later. Eight lives were lost. In the San Joaquin Valley the highest wind velocities ever recorded there occurred on January 27th, and great damage again resulted in the oil fields. Throughout the central portion of the State the lowest barometric pressure of which there is any authentic record was reached on that date, and was followed but four days later, on the 31st, by the highest pressure ever recorded. Estimates of the financial losses sustained during this notable month can not now be given with any degree of accuracy.

In spite of the adverse climatic conditions experienced during January the agricultural interests did not suffer as greatly as might have been expected. Frosts occurring in January usually do little harm in this State, and such was the case this year. The principal damage from an agricultural point of view was due to wind and water. The high winds blew down some of the unharvested citrus fruit, and uprooted young trees of various kinds. Considerable soil erosion resulted from the excessive rains and the subsequent floods in the southern part of the State. In the interior valleys the continuous saturated condition of the soil caused early sown grain to rot in the ground. The unfavorable weather made out-door work impossible and further delayed the harvesting of the citrus crop. Delays in railroad transportation added to the difficulty of getting products to market. Farm animals suffered from exposure due to the severe weather, and in Sonoma County many sheep perished as a result. At the close of the month the seasonal precipitation to date was about normal in the extreme north portion of the State, while the central and south portions had two to three

times the normal rainfall. While the month was unfavorable agriculturally, it is believed that no permanent injury has been sustained.—A. H. P.

MISCELLANEOUS PHENOMENA.

Thunderstorms.—Auberry, 27; Bonita, 19; Branscomb, 10; Dudleys, Kinsley, La Jolla, 27; Los Plumas, 25; Lindsay, 5, 29; Peachland, 4; Point Loma, 19; St. Helena, 9; Three Rivers, 27; Upper Mattole, 30.

Earthquakes.—Cahuilla, 10; Claremont, Corona, 1; Peachland, 15; Rialto, 1.

COMPARATIVE DATA FOR JANUARY.

MEAN MONTHLY TEMPERATURE FOR THE STATE.

1897	45.5	1907	43.9
1898	41.0	1908	46.7
1899	46.4	1909	47.8
1900	47.9	1910	41.9
1901	43.9	1911	45.7
1902	44.5	1912	47.7
1903	46.6	1913	41.6
1904	45.8	1914	46.9
1905	48.3	1915	44.2
1906	47.5	1916	39.8

AVERAGE PRECIPITATION FOR THE STATE.

1897	2.69	1907	7.46
1898	1.08	1908	4.63
1899	3.53	1909	16.17
1900	3.30	1910	4.86
1901	5.21	1911	13.20
1902	1.38	1912	3.58
1903	4.56	1913	5.06
1904	1.38	1914	13.09
1905	4.37	1915	7.58
1906	7.86	1916	15.61

Daily Precipitation for January, 1916.

Stations.	Day of Month.																															Total	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31		
Abbotts	.53	.70	2.06	1.33		.29		.05	.86	1.52	.18	.91	.07				4.15	.20	.14				.38	.16	.72		.73	1.16	.78	.08	17.00		
Aguanga						.05		.36	.04	.52				.07	1.30	3.00	3.80	1.31						.09	.04	.21	.01	5.00	2.00	.05	.35	17.85	
Alturas	.07	.01	1.44	.04		.02		.11	.31	.41	.02			.60	.07		.16	.03	.30	.01												4.35	
American Camp	.50	1.10	1.54		1.53			1.08	.60			.30	.15	.40	.54	10.34	.66						.50	.61	1.25	.78	10.14	.45	.60	1.50	17.63		
Angiola			.78	.58		.75			.07	.46				.35			.35						.60								4.49		
Antelope Valley		1.13	.08	.55		.12			.45	.28	.58			.10	.85		.98														7.15		
Antioch	.20	.40	2.65		.35				.45	.28	.58			.10	.85		.98						.38	.20	.22		.06		.88	.38	.26	30	7.15
Arrowhead Springs																																9.37	
Atascadero	1.11	.60	.60	.97	.20			.37	.36	.87				.61		.09	3.94	.54	.26				.08	.33	.69	.06	3.19	.13	.48		15.51		
Auberry	.42	.80	.11	1.79	.09	.36		.76	.32	.90				.90			1.45	.97	.55				.89	.81	1.44		1.71	.29	.33		15.19		
Auburn	.28	.52	1.71	1.40		.05	.01	.10	.98	1.38	.10			.31	1.25	.65	.01	.41	.40	.01			.60	.20	1.55	.04	.32	.40	.38	.08	13.17		
Avalon																																	
Azusa	1.06	.36		.06	.17	.10				1.50	.27			.01	.30	0.62	10.4	7.76	.95	.16			T.	T.	1.17	10.12	1.57	T.	.46		20.32		
Bagdad																																0.88	
Bakersfield	.22			.21		.05		T.	.04	.17				.03			.12	1.14	1.10	.07				11	T.	.19	.01	.20	T.	.04	2.70		
Barstow									.20	.18							.40	1.03	.87	.11												3.39	
Bear Valley				1.93											1.29																4.07	1.00	8.29
Boar Valley Dam																																	
Beaumont				.12	.35			.50	.26	.50				.28	1.52	2.08	2.20	1.71	.70							.56	.67	1.58	2.70	.08	.35	16.16	
Beaumont (near)	.30	.38		.09	.30			.68	.43	.78				.28	.30		5.95	2.55	.61	.74					.53	.55	2.02	4.18			21.30		
Belotta	.34	.15	1.01	1.62		.10		.15	.55	1.05				.09	1.00	6.37		.82	.35					.02	.43	.02	1.00		.60	.75	.63	11	10.25
Ben Lomond	1.00	3.92	1.59	.55		.05	.45	1.18	1.90					2.08	3.90	.07	.25	2.13	1.18	.15				2.45	2.05	2.30	1.27	5.00	.95	.15	29.07		
Berkeley	.72	.92	.52	.13	.53	.18	.02	.58	.50				.03	1.60	1.80	.22	.07	.68	.06	.03			.03	.50	1.06	1.60	.05	.83	.28	.60	16.54		
Betteravia	.30	.05	1.00		.30			.15	.41					.50	.20		.80	.75	.45								1.80	.60	.20		7.86		
Big Bar	.37	.48	.61	.11	.06	.15	.32	.71	.82	.67	.02	.18	.22	.20	.33	.19							T.	2.37	1.50	1.00	.24	.30	.20	.10	.03	11.32	
Biggs	.20	.20							.70					1.00	.80	.80	1.40							.90		1.02	.41	1.10	.80	.20	.10	10.13	
Big Sur	1.02	1.08	3.09	.08	.94			1.20	.50	.99				.38	2.87	.15	1.57	.38														21.42	
Bishop	.70	.80	1.40	.33		1.73			.10	.15				.70		2.60	.40															9.51	
Bishop Creek	1.20	1.10	T.	.50				.40	.80					.70		2.40	1.00															9.10	
Blocksburg	.30	.40	.67	.45		.22		.30	.60	2.11	.60	.58	1.60	.40	3.0	1.65	.28			.05			12	2.20	2.25	1.55	.40	.02			17.06		
Blue Canon	.30	1.20	2.80	.20	.10	.05		.03	2.40	3.00	.60	1.00	1.00	2.50	1.00		.40															29.42	
Blythe																																	1.49
Boca	.40	.60	2.00	3.80	1.00			.40	3.00	3.00				.40	2.00		.70	2.20	.40													23.60	
Bonita						.07			.10			.37		.65	T.	.50	1.48	2.16	.58	.41												10.29	
Boulder Creek	.60	3.63	* 2.10	.10	.66	.10	.65	1.10	1.17	.14	*	1.22	1.66	.22	.52	1.92	.10	.35						2.02	.92	2.45	*	.35	1.48	.75	.22	27.43	
Bowman's Dam																																	
Branscomb	.37	.91	1.36	.48		.66	.64	2.81	1.30	.95		.90	.56	.55	4.0	1.10	.40	.05	.20	.35			10	2.62	4.28	3.05	.71	.38	.15	.55	22	25.43	
Brawley	.25	.40	.50	.25				1.75	.50			.05	.10	.10			1.10															1.39	
Bridgeport	.03	.60	2.00		.70	.13	.20	1.33	.64	.50		.16	T.	1.57	.36	2.4	.05	.50	.04					.80	.94	.18	1.8	T.	.26	.20	.18	6.70	
Brney	.25	.40	.50	.25				1.75	.50			.05	.10	.10			1.10															11.45	
Cahuilla	.03	.60	2.00		.70	.13	.20	1.33	.64	.50		.16	T.	1.57	.36	2.4	.05	.50	.04					.80	.94	.18	1.8	T.	.26	.20	.18	14.61	
Calaveras Ranger Station	.29	.60	1.90	1.81	.08	.24		1.35	.78	2.13				.15	2.00	.54	*	2.34	.66	.50				.13	1.50	1.57	1.80	.08	1.58	.90	1.37	23.84	
Calaveras																																	1.09
Campbell	.20	.75	2.30	.70	.23			.33	1.0	.55				.10	.90	T.	1.00	.06	.01													10.05	
Campo																																	20.44
Camptonville (near)	.81	1.20	4.80	.25	T.	.13	.60	1.09	1.03	1.36	.01	1.10	1.90	2.09	1.0	.30	.87	.34	.55													29.01	
Canon Dam	.21	1.69	3.80	.30	T.	T.		1.14	.60	1.06			T.	.74	2.25	1.60	T.	1.12	.28	.10												19.22	
Cascade	.90	1.57	1.62		.80			.51	1.88	.44	.60			.44	.97		2.15	1.42	1.04					1.40	.39	1.01	.70	.34	1.05	1.14	.70	21.07	
Cedarville	.13	.05	1.25			T.	.05			.50			T.	T.	.58	.04		.35	1.0	.06												3.72	
Center Ranger Station																																	
Centerville	.56	1.25	5.20	.15	.06	.16	T.	2.30	.15	.27	T.	.31	.98	2.10	T.	.92	.17	.20	.42	T.				.75	3.20	1.48	.14		.85	.30	.16	T.	22.08
Chester	.60	1.00	3.50	.25				1.85	.70	.85		.25	.80	1.30	.05	.80	.45	.45	.35													15.96	
Chico	.40	1.20	3.80	.18				.85	.05	.08				.12	.34	.65	.02	.66	.09	.05	.14											12.48	
China Flat	.34	1.13	.64	.45	T.	.25	.75	2.39	.69	1.23	T.	.30	.47	.20	.57	.78	.19															16.74	
Cisco	1.20		.50	4.80		T.	T.	.50	4.0	3.60	T.	T.	1.50	2.40	1.50		.30	.60	.30	T.				T.	T.	1.11	T.	1.00	.50	60.10	30	26.20	
Claremont		1.00	.09		.28	.12		1.07	.27					.02	.38	.07	4.68	4.41	.82	.42	T.											5.8	18.37
Cloverdale	.60	1.65	1.09	.52	.18	.05	1.00	1.80	.75	.62		.30	.28	.65	.43	.87	1.4	.1	.03					1.54	2.53	.53	.07	.48	.41	.20	.01	16.73	
Coalinga	.02	.60	.18	.23		.04			.12	.40				.07	.23		1.05	.33	.25	.03												5.06	
Colfax	.40	.30	4.25	2.26		T.	.12		1.84	.94	.40		.30	.40	1.40		1.10	.72	.20	.04												22.13	
Colgate	.28	1.00	4.10	2.02	.15	.03	.03	1.0	1.24	.95	.32		.97	2.44	.47	.02	.46	.36	.23	.09												21.12	
Colusa	.50		5.60	.27	.11	.04	T.	.10	.18	.18																							



Daily Precipitation for January, 1916.—Continued.

Table with columns for Stations, Day of Month (1-31), and Total. Rows list various locations such as Porterville, Portola, Priest Valley, Quincy, etc., with their respective precipitation amounts for each day.

Except as otherwise indicated observations are generally made late in the afternoon, near sunset, and precipitation recorded is for the 24 hours ending at the time of observation. \*\*\* Regular Weather Bureau station; precipitation is for the 24-hour period, midnight to midnight. ††† Precipitation measured in the morning; amount then recorded is for the preceding 24 hours. \* Precipitation included in the next following measurement. † Separate dates of fall not recorded. T, Trace, or less than 0.01 inch.

DELAYED REPORTS.

Table with columns for Stations, Month, Temperature (Mean, Max., Date, Min., Date), and Total precipitation. Rows include Berkeley, Bowman's Dam, Chester, and San Miguel Island.

ERRATA. DECEMBER, 1915.

San Francisco, page 143, actual hours of sunshine 296, should be 138. San Luis Obispo, page 143, actual hours of sunshine 110, should be 172. Per cent. of possible 66, should be 56. Paso Robles, pages 145 and 149, precipitation total is deficient, and the correct total is unavailable. NOTE:—Beginning with this issue the stations heretofore published under the names Arbolado and Mammoth Tank will appear as Big Sur and Sterling, respectively.

Daily Temperature for January, 1916.

Table with columns for Stations, days 1-31, and Mean. Rows list various California locations such as Alturas, Bakersfield, Barstow, etc., with their corresponding temperature data for each day of the month.

**Snowfall Data. [In inches.]**

**SNOWFALL IN THE MOUNTAINS.**

WATERSHED, COUNTY, STATION.	Total snowfall.	Water equivalent.	Am't on ground 15th.	Am't on ground 31st.	Compr'd with normal.
<b>Klamath Watershed.</b>					
<i>Siskiyou County.</i>					
Yreka .....	33		11	4	-17
<i>Trinity County.</i>					
Hayfork .....	77		29	23	
Ruth .....	103		39	18	
<i>Humboldt County.</i>					
Weitchpec .....	68		34	8	+51
<b>Mountain Lakes.</b>					
<i>Modoc County.</i>					
Cedarville .....	52		18	5	+37
Fort Bidwell .....	53		24	18	
<i>Lassen County.</i>					
Eagle Lake .....	74		44	38	+21
Fredonia .....					
Madeline .....	80		36	30	+58
Susanville .....	107			32	+79
<i>Tehama County.</i>					
Mineral .....					
<i>Nevada County.</i>					
Boca .....	216		55	60	+147
Truckee .....	143		60	84	+100
<i>Inyo County.</i>					
Bishop Creek .....	91		43	55	+39
Lone Pine .....	48		2	6	
Wells Meadow .....	97		25	46	
<b>Sacramento Watershed.</b>					
<i>Siskiyou County.</i>					
Dunsmuir .....					
McCloud .....	154		66	55	+92
Sisson .....	150		45	38	+118
<i>Modoc County.</i>					
Alturas .....	38		15	10	+24
<i>Shasta County.</i>					
Burney .....	85		44	32	+60
<i>Plumas County.</i>					
Bucks .....	233		175	216	
Canon Dam .....	97		73	68	+66
Chester .....	140		65	63	
Clover Valley .....	141		60	62	+87
La Porte .....	149		97	120	+86
Portola .....	112		60	51	
Quincy .....	133		45	52	+104
<i>Butte County.</i>					
De Sabla .....	105		30	27	+87
Inskip .....	212		101	120	+134
Stirling City .....	72				+40
West Branch .....	136		52	56	+90
<i>Yuba County.</i>					
Camptonville .....	129		53	40	+97
<i>Sierra County.</i>					
Bunker Hill .....					
Dorsey's .....					
Downieville .....	110		38	48	+75
Sierra City .....	159		78	69	+86
Sierraville .....	111		40	49	+61
Table Rock .....	278		156	190	+181
<i>Nevada County.</i>					
Bowman's Dam .....					
Deer Creek .....	189		76	60	+135
Fordyce Dam .....	262		140	161	+164
Lake Spaulding .....	226		118	138	+168
<i>Placer County.</i>					
Blue Canon .....	228		118	134	+174
Cisco .....	261		163	180	+186
Emigrant Gap .....	210		125	142	+156
Summit .....	255		178	215	+176
<b>San Joaquin Watershed.</b>					
<i>Alpine County.</i>					
Tamarack .....	192		158	203	+5
<i>Tuolumne County.</i>					
Center Ranger Station .....					
Hetch Hetchy .....	29		8	11	+18
Lake Eleanor .....	92		42	56	+41
<i>Mariposa County.</i>					
Yosemite .....	94		32	46	+55
<i>Fresno County.</i>					
Cascada .....	72		22	32	
Hume .....					
Huntington Lake .....	118		66	96	
<i>Tulare County.</i>					
Hot Springs .....	22				+20
Springville .....	84				+69
<b>Mountains of Southern California.</b>					
Bear Valley Dam .....	36		4	30	+9
Converse Nursery .....	46		3	6	
Holcomb .....	80		22	36	+59
Squirrel Inn .....	41		20	27	+32
Seven Oaks .....	36				+22
Nellie .....	21		0	6	
Julian .....	15		7	1	

Unlike the preceding month, the snowfall in the mountains during January, 1916, was heavy throughout the state of California. While only a fraction of the usual amount covered the ground at the end of December, the snow on the ground at the end of January was the heaviest in years. Just as the precipitation for the State as a whole was excessive, so the snowfall in the elevated regions was abnormally heavy. Most of the snow was brought by the storms of January 1-3, 13-19, and 26-29, all three of which were especially severe. Railroad blockades were the unavoidable results of all of these storms. The persistent low temperature, partially due to the absence of sunshine, conserved the snow in the mountains, though the warm rain accompanying the storm of January 13-19 melted considerable snow in the mountains adjacent to the San Joaquin Valley, and in the mountains in southern California. Owing to the low temperatures prevailing throughout the month a portion of the precipitation in the interior valleys and even along the coast was in the form of snow. Three times during the month the hills in the San Francisco Bay region were snow-covered. In the Sierra Nevada Mountains enormous deposits of snow accumulated during the month, and little was lost due to melting. A snow survey made by the Southern Pacific Company between January 24 and 27 gave the following results:

Andover: Depth on ground 120 inches; weight per cubic foot, 1st foot 7 pounds, 3rd 19, 5th 21, bottom 23.

Blue Canon: Depth on ground 70 inches; weight per cubic foot, 1st foot 21 pounds, 3rd 23, bottom 25.

Boca: Depth on ground 48 inches; weight per cubic foot, 1st foot 8 pounds, center 21, bottom 23.

Cisco: Depth on ground 114 inches; weight per cubic foot, 1st foot 19 pounds, 3rd 22, 6th 25, bottom 26.

Colfax: Depth on ground 6 inches; weight per cubic foot, 22 pounds.

Summit: Depth on ground 168 inches; weight per cubic foot, 1st foot 10 pounds, 3rd 14, 6th 18, 10th 22, bottom 28.

Truckee: Depth on ground 96 inches; weight per cubic foot, 1st foot 9 pounds, 3rd 19, 5th 21, bottom 23.

Bearing in mind the fact that 1 cubic foot of water weighs 62 pounds, and that 1 cubic foot of ice weighs 57 pounds, it is apparent that the snow is well packed. Throughout the State a more than ample amount of water for irrigation and power purposes is already assured for the coming summer. — A. H. P.

**COMPARATIVE SNOWFALL DATA FOR JANUARY.**

(Amount on the Ground.)

	FORDYCE DAM.			SUMMIT.			TAMARACK.		
	1st.	15th.	31st.	1st.	15th.	31st.	1st.	15th.	31st.
1907 .....	58	106	94	45	142	148	125	175	180
1908 .....	69	63	68	87	72	87	75	94	104
1909 .....	25	68	107	28	90	172	35	150	190
1910 .....	60	78	87	54	87	68	72	96	106
1911 .....	0	99	124	4	136	218	24	130	310
1912 .....	49	39	59	60	46	41	44	50	55
1913 .....	28	73	78	17	79	88	40	98	118
1914 .....	63	95	107	80	132	192	116	178	274
1915 .....	30	59	67	24	56	80	26	50	116
1916 .....	54	140	161	44	178	215	62	158	208